

Descriptions for DECam Property Accountability Transfers from DOE to NSF  
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These descriptions are provided to Jack Kelly as part of the information needed on SF-122 forms to transfer DOE DECam property that has not yet been transferred to NSF. This information was prepared in response to a request from Lisa Rogers (a DOE/FSO Contracting Officer) on January 27 2011. These descriptions map to the categories in des-docdb 4846 "BCWS ..." Each description is intended to be "stand alone" and thus the terms DECam and DES, for example, are repeated.

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#### Filters

This is the generic description that assumes all five are shipped at one time. The plan has changed from this.

"These five narrow band pass filters (grizY) are for use with the Dark Energy Camera (DECam) at CTIO for the Dark Energy Survey (DES) experiment. Each filter allows a specific range of wavelength of light to pass through and blocks other wavelengths."

Aside (not to be included in SF-122): Stanford University has agreed to reimburse Fermilab for the Y-band filter in exchange for admission to the Dark Energy Survey (DES) experiment.

This is the description for the i and z filters (the g and r filter description is expected to be similar):

"Five narrow band pass filters (grizY) are for use with the Dark Energy Camera (DECam) at CTIO for the Dark Energy Survey (DES) experiment. Each filter allows a specific range of wavelength of light to pass through and blocks other wavelengths. This accountability transfer is for the i and z band filters which have been accepted for delivery to CTIO."

This is the description for the y band filter:

"Five narrow band pass filters (grizY) are for use with the Dark Energy Camera (DECam) at CTIO for the Dark Energy Survey (DES) experiment. Each filter allows a specific range of wavelength of light to pass through and blocks other wavelengths. This accountability transfer is for the y band filter that has been accepted for delivery to CTIO and is an in-kind contribution to the DECam Project from Stanford University."

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#### RASICam

Radiometric All Sky Infrared Camera (RASICam) will be used to view sky conditions for

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providing weather data to the Dark Energy Camera (DECam) at CTIO for the Dark Energy Survey (DES) experiment. This device includes an A325 FLIR (Forward Looking InfraRed) camera for which AURA has obtained the necessary export license.

Aside (not to be included in SF-122): The "BCWS ..." document in des-docdb 4846 refers to this as a "Cloud Camera."

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#### Barrel

The Barrel is a component of the Corrector for the Dark Energy Camera (DECam) at CTIO for the Dark Energy Survey (DES) experiment. The Barrel holds the 5 lenses that direct light from the primary mirror of the telescope onto the CCDs in the DECam focal plane.

Aside (not to be included in SF-122): The Barrel is one of the components of the Corrector that is to be assembled at UCL. DES-UK has taken on the primary role in providing the Corrector in exchange for admission to the Dark Energy Survey (DES) experiment. The SF-122 for the Barrel needs to be completed before it leaves England for Chile.

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#### SISPI

The Survey Image System Process Integration (SISPI) system is the mountaintop computer system for the Dark Energy Camera (DECam) at CTIO for the Dark Energy Survey (DES) experiment. It is comprised of computers, data disk arrays and networking hardware for collecting and processing data for DECam.

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#### Imager

The Imager comprises CCD packages on the focal plane in a vacuum vessel and the front-end electronics (FEE) including boards, cabling, four crates, power supplies, and other items. It is part of the Dark Energy Camera (DECam) at CTIO for the Dark Energy Survey (DES) experiment.

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#### Camera Support Equipment

Support equipment for the Dark Energy Camera (DECam) at CTIO for the Dark Energy Survey (DES) experiment includes the Prime Focus (PF) cage, the Hexapod alignment assembly, the Shutter, the Imager and filter changer installation fixtures, counterweights, and an installation platform for the Imager.

The PF cage is the mechanical interface that attaches DECam to the Blanco telescope at CTIO. The Hexapod performs precise alignment of DECam during observations. The Shutter prevents or allows exposure of the CCDs to light.

Aside (not to be included in SF-122): The "BCWS ..." document in des-docdb 4846 refers to this "Camera Support Equipment" as "Lab A" because it was tested on the Telescope Simulator located at Fermilab in Lab A.

Aside (not to be included in SF-122): The filter changer mechanism (FCM) itself is not included in this description of the Camera Support Equipment because it is provided by the University of Michigan in exchange for admission to DES, and is not subject to the NSF/DOE DECam Property Transfer MOU.

The following description is specific to the Camera Support Equipment (CSE) in the shipment being packed up in May 2011 to be sent by boat. The CSE shares this shipment with some LN2 equipment:

"Support equipment for the Dark Energy Camera (DECam) at CTIO for the Dark Energy Survey (DES) experiment includes items that are sufficiently robust for shipment by boat. These include parts of the Prime Focus (PF) cage, counterweights, a metal dummy barrel, and other similarly robust items. The PF cage is the mechanical interface that attaches DECam to the Blanco telescope."

The following description is specific to the Camera Support Equipment (CSE) in the shipment being packed up in June 2011 to be sent by boat:

"Support equipment for the Dark Energy Camera (DECam) at CTIO for the Dark Energy Survey (DES) experiment includes items that are sufficiently robust for shipment by boat. These include parts of the Prime Focus (PF) cage, a cover and baffle for the largest lens, metal supports and installation fixtures, the PF cage cooling system, and other similarly robust items. The PF cage is the mechanical interface that attaches DECam to the Blanco telescope."

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F/8

The F/8 handling platform and equipment are used to swap the F/8 mirror and its counterweight on the Dark Energy Camera (DECam) cage at CTIO for the Dark Energy Survey (DES) experiment.

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CCDs

Charge-Coupled Devices packages (CCDs) were produced for the Dark Energy Camera (DECam). A full DECam focal plane has 62 2k-by-4k CCDs and 12 2k-by-2k CCDs. There will be 10 spare CCDs.

The CCD packages for the Imager will be part of the Imager SF-122.

There may be other shipments of CCD packages to CTIO if the full complement is not available when the Imager is shipped. If so, the additional SF-122 forms might read in part: "These Charge-Coupled Devices packages (CCDs) are for use on the Dark Energy

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Camera (DECam) at CTIO as part of the Dark Energy Survey (DES) experiment."

CCDs that are not included in the initial allotment of 84 (62 + 12 + 10) can be used for many purposes, but it should be kept in mind that the US classifies them as export controlled technology at this time (February 28 2011.)

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LN2 Cooling

The liquid nitrogen (LN2) cooling system provides cryogenic temperature control for the CCDs in the Dark Energy Camera (DECam) for the Dark Energy Survey (DES) experiment.

This accountability transfer includes some of the cryogenic hoses that will move the LN2 from its supply to the camera on the telescope and back to the supply.

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Calibration

This Calibration equipment is to be used inside the telescope dome for the Dark Energy Camera (DECam) at CTIO for the Dark Energy Survey (DES) experiment.

This equipment consists of a screen that will be sent to CTIO first with the remainder to be sent later.

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PreCam

PreCam is a small-scale version of the Dark Energy Camera (DECam) using some DECam components (e.g., CCDs and Front End Electronics). It can be mounted on the Curtis-Schmidt telescope at CTIO and can be used to provide sky-related calibration measurements for the Dark Energy Survey (DES) experiment.

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